REMARKS

Claims 1 – 51 are pending in the application. Claims 1, 19, and 51 are currently amended. Claims 52-57 are currently added.

Claim Objections

Claims 19, 21 and 22 were objected on grounds of informalities.

More specifically, the claims were rejected because of the use of the word "prestored".

Claims 19, 21 and 22 are amended so as to overcome the objection.

Favorable reconsideration of this objection in view of the above amendments is respectfully requested.

Double Patenting

The Examiner noted the confliction of claims of this application with claims 1-11, 28-31, and 33-46 of Application No. 10/468,101.

A Terminal Disclaimer letter, accompanied by the fee set forth in USC 37 CFR 1.20, is attached to this OA Response.

Claim Rejections – 35 USC 101

In this section of the official action, the Examiner rejected claims 1-18 and 51 under 35 USC 101, as directed to non-statutory subject matter.

Claims 1 and 19 are amended so as to define a computer embodied apparatus. The computer may be a stand alone PC, a networked computer, a web server, a digital

signal processor (DSP), a smart card, or any other computing unit. Claim 51 is amended so as to define a computer implementing a method. It is maintained that the amended claims 1, 19, and 51 now define a concrete and tangible invention. Favorable reconsideration of this rejection in view of the above amendments is respectfully requested.

Claim Rejections – 35 USC 103

In this section of the official action, Claims 1- 21, and 26-51 were rejected under 35 USC 103(a) as being unpatentable over Rissanen J. "A Universal Data Compression System", published on IEEE Transactions on Information Theory, Sep. 1985, Vol. 29, and Weinberger et al. "A Universal Finite Memory Source", IEEE Transactions on Information Theory, May 1995, Vol. 41.

The Present invention teaches a method where a stochastic tree model is compared with a reference tree, for example a pre-stored, previously obtained reference stochastic tree model, for determining whether a *statistically significant change* occurs between the *two models*. The present application describes on page 23, line 14: "A comparator 18 comprises a statistical distance processor 20, which is able in one embodiment to make a statistical distance measurement between a model generated from current data and a prestored or reference model. In a second embodiment the statistical distance processor 20 is able to make a statistical distance measurement of the distance between two or more models generated from different parts of the same data. In a third embodiment, the statistical distance processor 20 is able to make a statistical distance measurement of the distance between a pre-stored model and a data sequence."

The novel and inventive ideas introduced by the present invention may be used for numerous medical applications, as well as other applications, as described on page 66, in line 3: "Medical applications for the above embodiments are numerous. Any signal representing a body function can be discretized to provide a finite set of symbols. The symbols appear in sequences which can be modeled and changes in the sequence can be indicated by the comparison step referred to above. Thus medical personnel are provided with a system that can monitor a selected bodily function and which is able to provide an alert only when a change occurs. The method is believed to be more sensitive than existing monitoring methods."

Rissanen teaches a universal *data compression algorithm* where a binary tree is grown in a bottom-up process. More specifically, Rissanen suggests to collect overlapping sets of symbols, each set defining a "context" on which symbol occurrences can be conditioned, as described on page 658, in section III, entitled "A Context Gathering Algorithm", in the third paragraph: " In order to obtain a more powerful model we must abandon the requirement that the collected segments partition the string. Instead, we plan to collect overlapping sets of symbols, each set defining a "context" on which symbol occurrences can be conditioned. As proved in [8], such conditioning allows for a more efficient way to take advantage of statistical regularities".

Weinberger discloses *irreducible parameterization for a finite memory source*, in the form of a tree machine. Weinberger introduces an algorithm where a tree is completed by growing the tree in directions where repeated symbol occurrences take place, as described in section III, entitled: "A natural finite-memory source": "The goal of this stage is to accumulate all the relevant contexts of the associated symbol statistics in a

practical way as the length of the string grows. The tree will grow only in directions where repeated symbol occurrences take place, and the counts of all symbols in all the contexts that have occurred are gathered, except a few early occurrences prior to the creation of the specific node". Then, the completed tree is compared with the original tree, and only a context selection rule is used for deciding which of the additions are to be retained, as described on page 647, in line 5: "We now complete the selection of the optimal context and of T_1..."

Claim 1 defines an apparatus embodied in a computer for building a stochastic model of a data sequence, the data sequence comprising time related symbols selected from a finite symbol set, the apparatus comprising: an input for receiving the data sequence, a tree builder, for expressing the symbols as a series of counters within nodes, each node having a counter for each symbol, each node having a position within the tree, the position expressing a symbol sequence and each counter indicating a number of its corresponding symbol which follows a symbol sequence of its respective node, a tree reducer, for reducing the tree to an irreducible set of conditional probabilities of relationships between symbols in the input data sequence, *and a comparator for comparing the reduced tree with a reference tree obtained in advance of the receiving sequential data*, thereby to determine whether there has been a statistical change between the two trees.

As explained hereinabove, and defined by claim 1, the present invention teaches an apparatus embodied in a computer. The apparatus includes a *comparator for comparing the tree with a reference tree obtained in advance of the receiving sequential data*, thereby to determine whether there has been a statistical change between the two trees, for example at some point in time.

Rissanen never teaches or even hints at the idea of an apparatus having a comparator for comparing a tree with a previously obtained tree, thereby to determine if there as been a significant statistical change between the two trees, as taught by the present invention and defined by claim 1.

Weinberger describes obtaining a tree, growing the tree, and comparing the content of the tree before and after the growing of the tree, for optimizing the grown tree according to optimized context criteria. That is to say, Weinberger teaches an internal comparison made between a tree and the *same* tree having been grown. However, Weinberger also fails short of teaching or event hinting at the idea of an apparatus having a comparator for comparing a tree with *a reference tree, for example a previously obtained tree*, thereby to determine if there as been a significant statistical change *between the two trees.*

It is thus respectfully believed that claim 1 is both novel and inventive over the prior art, and maintained that claim 1 is allowable.

Claim 19 defines an apparatus embodied in a computer for determining statistical consistency in time sequential data, the apparatus comprising: a sequence input for receiving sequential data, a stochastic modeler for producing at least one stochastic model from at least part of the sequential data, and *a comparator for comparing the sequential stochastic model with a reference model obtained in advance* of the receiving sequential data, thereby *to determine whether there has been a statistical change* in the model.

As explained hereinabove, and defined by claim 19, the present invention teaches an apparatus embodied in a computer, the apparatus having a *comparator for comparing a sequential stochastic model with a reference model obtained in advance* of the

sequential stochastic model, thereby *to determine whether there has been a statistical change* in the model.

As explained hereinabove, neither Rissanen nor Weinberger teaches or even hints at the idea of an apparatus having such a comparator for *comparing the two models*, to *determine if there as been a statistical change* between the two models, as taught by the present invention and defined by claim 19. For example the comparison may be between a series of models taken at different times and therefore enabling continuous monitoring of the process.

It is thus respectfully believed that claim 19 is both novel and inventive over the prior art, and maintained that claim 19 is allowable.

Claim 51 defines a computer implementing a method for building a stochastic model of a data sequence, the data sequence comprising time related symbols selected from a finite symbol set, the method comprising: receiving the data sequence, expressing the symbols as a series of counters within nodes, each node having a counter for each symbol, each node having a position within the tree, the position expressing a symbol sequence and each counter indicating a number of its corresponding symbol which follows a symbol sequence of its respective node, reducing the tree to an irreducible set of conditional probabilities of relationships between symbols in the input data sequence, thereby to generate a stochastic model of the sequence, and *comparing* the *stochastic model with a previously obtained reference model*, thereby to determine if there has been a statistically change between the two models.

As explained hereinabove, neither Rissanen nor Weinberger teaches or even hints at the idea of *comparing* the *stochastic model with a previously obtained reference*

model, to determine *if there has been a statistical change* between the two models, as taught by the present invention and defined by claim 51.

It is thus respectfully believed that claim 51 is both novel and inventive over the prior art, and maintained that claim 51 is allowable.

All dependent claims are believed to be allowable as being dependent upon an allowable main claim.

All of the matters raised by the Examiner have been dealt with and are believed to have been overcome.

In view of the foregoing, it is respectfully submitted that all the claims now pending in the application are allowable over the cited reference. An early Notice of Allowance is therefore respectfully requested.

Respectfully submitted,

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Encl:
Petition for Extension of Time (3 months)
Additional Claims Transmittal
Terminal Disclaimer